Academic Program Description Form

University Name: University of Mosul

Faculty/Institute: College of Petroleum and Mining Engineering

Scientific Department: Department of Petroleum Reservoir Engineering

Academic or Professional Program Name: Bachelor / Petroleum Reservoir Engineering

Final Certificate Name: Bachelor of Engineering in Petroleum Reservoir Engineering

Academic System: Bologna and Semester System

Description Preparation Date: 7 May 2025

File Completion Date: 14 September 2025 (**Revised Version**)

Signature:

Head of Department Name:

Lect. Dr. Maha Muneeb Al-Dabagh

Date: 14/9/2025

كلية هندسة النفط والتعدين
قسم هندسة المكامن النفطية

Signature:

Dean Scientific Associate Name:

Asst. Prof. Dr. Muneef Mahjoob Mohammed

Date: 14/9/2025

The file is checked by:

Division of Quality Assurance and Performance Evaluation

Director of the Quality Assurance and Performance Evaluation Division: Sarah Jamal Halata

Date: 14/9/2025

Signature:

Approval of the Dean

Ma'an H. Abdullah

14. 9. 2025

جامعة الموصل
كلية هندسة النفط والتعدين

1. Program Vision

The leadership in petroleum reservoir engineering education and research, through preparing engineers specialized in oil and gas who possess modern knowledge and skills to efficiently utilize resources, achieve sustainability, support national development, and enhance competitiveness globally.

2. Program Mission

The Department of Petroleum Reservoir Engineering is committed to preparing distinguished engineers in oil and gas exploration and production through modern theoretical and practical curricula, integrating artificial intelligence and digital transformation technologies to enhance industry efficiency. The department also supports governmental and private sector institutions with scientific consultations and applied research, promoting sustainability and environmental protection.

3. Program Objectives

1. Provide modern academic programs in oil and gas engineering aligned with international standards and the needs of the labor market.
2. Enable students to use artificial intelligence and digital modeling techniques for efficient reservoir analysis and management.
3. Promote applied scientific research to address technical and environmental challenges in the oil and gas industry and support sustainability projects.
4. Build strategic partnerships with national and international oil companies to provide practical training and employment opportunities for graduates.
5. Offer technical and scientific consultations to governmental institutions and companies, contributing to efficient and environmentally responsible petroleum resource management.
6. Prepare research-oriented professionals capable of innovation, continuous development, and competing in both local and global markets.

4. Program Accreditation

The College of Petroleum and Mining Engineering, including the Petroleum Reservoir Engineering Department, is committed to achieving the nine standards outlined in the Iraqi Engineering Education Accreditation Council's guide

5. Other external influences

Non

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	9	59%	Essential
College Requirements	7	46	26%	
Department Requirements	45	120	69%	
Summer Training	Available			
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level		Course Name	Credit Hours

	Course Code		ECTC	SWL	USSWL	SSWL
First Year (Bologna Pathway)	PRE 111	Geology for engineers I	7	175	82	93
	PRE 112	Mechanics I	6	150	87	63
	PRE 113	Mathematics I	6	150	72	78
	UOM 102	English I (Reading and Writing)	2	50	17	33
	PRE 115	Engineering drawing	7	175	82	93
	UOM 104	Human rights and democracy	2	50	19	31
	PRE 121	Geology for engineers II	6	150	57	93
	PRE 122	Mechanics II	4	100	37	63
	PRE 123	Mathematics II	5	125	47	78
	UOM 101	Arabic	2	50	71	33
	PRE 125	Engineering drawing by AUTOCAD	5	125	32	93
	PRE 126	Principles of petroleum engineering	5	125	77	48
	UOM 103	Computer	3	75	27	48
Second Year (Bologna Pathway)	PRE 211	Structural Geology	4	100	59	41
	PRE 212	Fundamentals of petroleum engineering	5	125	47	78
	PRE 213	Petroleum properties	4	100	37	63
	PRE 214	Mathematics III	4	100	52	48
	PRE 215	Thermodynamics	4	100	37	63
	PRE 216	Fluid mechanics	4	100	37	63
	UOM2032	Computer II	3	75	42	33
	UOM2022	English language II	2	50	17	33
	PRE 221	Petroleum geology	6	150	57	93
	PRE 222	Strengths of materials	4	100	37	63
	PRE 223	Mathematics IV	5	125	77	48
	PRE 225	Occupational health and safety	4	100	59	41
	UOM2012	Arabic II	2	50	17	33
	UOM2050	Crimes of Baath regime in Iraq	2	50	17	33
	PRE 224	Petrophysical rock properties	7	175	82	93
Third			Theoretical		Practical	

	PRE 311	Seismic Reflection (Processes and Interpretation)	3	2
	PRE 312	Well logging	3	2
	PRE 313	Drilling engineering I	---	3
	PRE 314	Rock mechanics	3	2
	PRE 315	Production engineering I	---	3
	PRE 316	Applied reservoir engineering I	3	2
	PRE 317	Drilling engineering II	---	3
	PRE 318	Applied reservoir engineering II	3	2
	PRE 319	Production engineering II	---	3
	PRE 320	Natural gas technology	---	3
	PRE 321	Seismic interpretation	3	2
	PRE 322	Formation evaluation	2	2
Fourth Year (Semester)	PRE 411	Enhanced oil recovery I	---	3
	PRE 412	Reservoir Characterization	3	2
	PRE 419	Petroleum modelling	3	2
	PRE 414	Advanced reservoir engineering	3	2
	PRE 415	Core analysis	2	2
	---	Graduation project	3	1
	PRE 417	Enhanced oil recovery II	---	3
	PRE 418	Reservoir simulation	2	2
	PRE 413	Petroleum Economics	---	2
	PRE 420	Well testing	3	2
	PRE 421	Reservoir management	2	2

8. Expected learning outcomes of the program

Knowledge

A1: The ability to distinguish, identify, define, formulate, and solve engineering problems by applying the principles of engineering, science, and mathematics.

A2: The ability to recognize the continuous need for professional knowledge development, and to know how to search for, evaluate, assemble, and properly apply it.

Skills

B1: The ability to produce engineering designs that meet desired needs within specific constraints by applying both analysis and synthesis in the design process.

B2: The ability to conduct appropriate measurements and tests with quality assurance, analyze and interpret results, and use engineering judgment to draw conclusions. **B3**: The ability to communicate effectively, both orally with groups of people and in writing with various managerial levels. **B4**: The ability to work efficiently within teams, set objectives, plan activities, meet deadlines, and manage risks and uncertainties.
Ethics
C1: The ability to recognize ethical and professional responsibilities in engineering issues. **C2**: The ability to make sound decisions while considering global economic, environmental, and societal impacts.

9. Teaching and Learning Strategies

• Computer laboratories • Graduation projects • Industrial training • Field visits to oil facilities	• Theoretical lectures • Discussion sessions • Laboratory experiments

10. Evaluation methods

• **Quizzes, midterm, and final exams** • **Reports**	• **Practical exams and homework assignments** • **Presentations**

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer	Geology	Paleontology and Stratigraphy			1	
Lecturer		Geophysics			2	
Lecturer		Sedimentology			2	
Lecturer		Petroleum Geology			1	
Lecturer		Geochemistry			1	
Lecturer	Chemistry	Artificial Chemistry			1	
Assistant lecturer	Mechanical Engineering	Thermal forces			2	
	Civil Engineering	**Structure**			1	
		Soil Mechanics			1	
	Statistics	Research and Operations			1	
	English	Translation			1	

Professional Development

Mentoring new faculty members

- **Teaching methods courses**
- **Continuing education courses**
- **Training courses**
- **Scientific seminars, workshops, and study sessions**

Professional development of faculty members

A plan to develop the skills of the teaching staff in the Petroleum Reservoir Engineering Department by involving the largest possible number in local and international conferences, continuing education courses, scientific seminars, workshops, and study sessions held both inside and outside the university.

12. Acceptance Criterion

1- Iraqi nationality.

2- Holds an Iraqi preparatory school certificate endorsed by the General Directorate of Education in the governorate, or an equivalent certificate.

3- The student must be born in 2000 or later.

4- Must pass the medical examination according to the specific requirements of each program. Admitted students to colleges and institutes must undergo a (CBC) or (Hb-Electrophoresis) test at specialized medical centers. Blind students who meet the application requirements are allowed to apply through the central admission system for suitable humanitarian studies.

5- Must be fully dedicated to studying, and it is not permitted to combine employment with full-time study in morning colleges and institutes. This includes all employees of governmental institutions. To continue studying, employees must obtain a study leave from their departments according to the current regulations. It is also not permitted to

pursue two academic programs simultaneously; if such a case is proven, the Ministry will be notified to cancel the admission. If a student has two different admissions in the same year, they must choose one to cancel.

6- Must be a graduate of:

a. The current academic year.

b. The previous academic year, provided they were not accepted centrally into any college or institute. They can be admitted through the "previous year graduates" channel based on the minimum admission scores for their year of graduation, provided they did not enroll in private evening studies, public education, private morning education, or colleges affiliated with the endowments or institutes affiliated with other ministries.

7- Students returning from abroad in the tow academic year (2023/2024 and 2024/2025) are allowed to apply via the electronic portal of the Directorate of Studies, Planning, and Follow-Up using their designated electronic application form. The application will be considered valid once a temporary equivalency certificate is obtained from the Ministry of Education, Equivalency and Certificates Directorate. Graduates of the previous year must apply through the Central Admission Department, International Students Section.

8- Non-Iraqi students who hold an Iraqi preparatory certificate and are centrally admitted must be formally notified to report to the Central Admission Department / International Students Section to determine whether they are exempt from or required to pay tuition fees in foreign currency, according to the regulations stated in Chapter Seven of the Student Affairs Procedures Guide and Admission Rules and Conditions.

13. The most important sources of information about the program

- Textbooks and reference materials available in: free education resources, department library, college library, and the central library
- Scientific resources available on the electronic space (online resources)

14. Program Development Plan

To develop the program, a comprehensive plan is established focusing on improving academic quality, enhancing collaboration with industry, and developing the necessary skills for students to face future challenges in the energy sector. The focus areas include:

1. **Curriculum Update**
   - **Course Review**: Periodic assessment and review of the curriculum to ensure alignment with the latest advancements in petroleum reservoir engineering.
   - **Introduction of New Courses**: Offering courses that cover new and innovative technologies, such as digital oil extraction and the use of artificial intelligence in reservoir analysis.
2. **Industry Collaboration**
   - **Industrial Partnerships**: Developing partnerships with oil and gas companies and technology firms to provide training opportunities and collaborative research.
   - **Joint Projects**: Encouraging students to participate in joint research projects with industry to apply their knowledge in real-world working environments.
3. **Enhancing Infrastructure and Resources**
   - **Advanced Laboratories**: Upgrading laboratories and providing state-of-the-art equipment to enable realistic experiments and simulation of oil extraction processes.
   - **Access to Data and Software**: Providing access to industry databases and modern engineering software to strengthen students' learning and research capabilities.
4. **Student Skills Development**
   - **Workshops and Seminars**: Regular organization of workshops and seminars with industry experts to familiarize students with the latest challenges and innovations in the field.

- **Soft Skills Training:** Offering programs aimed at developing essential soft skills such as leadership, communication, and teamwork to prepare students for working in multidisciplinary teams.

5. **Performance Evaluation and Monitoring**

- **Continuous Evaluation System:** Developing a system for regular assessment of the program's performance, focusing on feedback from students and faculty members.

Program Skills Outline												
				Required program Learning outcomes								
Year/Level	Course Code	Course Name	Basic or optional	Knowledge			Skills			Ethics		
				A1	A2	B1	B2	B3	B4	C1	C2	
First Year (Bologna Pathway)	PRE 111	Geology for engineers I	Basic	•								
	PRE 112	Mechanics I	Basic	•								
	PRE 113	Mathematics I	Basic	•								
	UOM 102	English I (Reading and Writing)	Basic		•			•				
	PRE 115	Engineering drawing	Basic	•			•					
	UOM 104	Human rights and democracy	Basic							•		
	PRE 121	Geology for engineers II	Basic	•								
	PRE 122	Mechanics II	Basic	•								
	PRE 123	Mathematics II	Basic	•								

	UOM 101	Arabic	Basic		•			•				
	PRE 125	Engineering drawing by AUTOCAD	Basic	•	•		•					
	PRE 126	Principles of petroleum engineering	Basic	•								
	UOM 103	Computer	Basic	•	•							
Second Year (Bologna Pathway)	PRE 211	Structural Geology	Basic	•								
	PRE 212	Fundamentals of petroleum engineering	Basic	•								
	PRE 213	Petroleum properties	Basic	•								
	PRE 214	Mathematics III	Basic	•								
	PRE 215	Thermodynamics	Basic	•								
	PRE 216	Fluid mechanics	Basic	•			•					
	UOM2032	Computer II	Basic	•								
	UOM2022	English language II	Basic	•								

	PRE 221	Petroleum geology	Basic	•				•			
	PRE 222	Strengths of materials	Basic	•							
	PRE 223	Mathematics IV	Basic	•							
	PRE 225	Occupational health and safety	Basic	•					•	•	•
	UOM2012	Arabic II	Basic					•			
	UOM2050	Crimes of Baath regime in Iraq	Basic								•
	PRE 224	Petrophysical rock properties	Basic	•			•				
Third Year (Semester)	PRE 311	Seismic Reflection (Processes and Interpretation)	Basic	•	•		•				
	PRE 312	Well logging	Basic	•							
	PRE 313	Drilling engineering I	Basic	•			•				
	PRE 314	Rock mechanics	Basic	•							
	PRE 315	Production engineering I	Basic	•			•				
	PRE 316	Applied reservoir engineering I	Basic	•							

Third Year (Semester)	PRE 317	Drilling engineering II	Basic	•			•				
	PRE 318	Applied reservoir engineering II	Basic	•							
	PRE 319	Production engineering II	Basic	•			•				
	PRE 320	Natural gas technology	Basic	•							
	PRE 321	Seismic interpretation	Basic	•			•				
	PRE 322	Formation evaluation	Basic	•			•				

Fourth Year (Semester)	PRE 411	Enhanced oil recovery I	Basic	●			●							
	PRE 412	Reservoir Characterization	Basic	●										
	PRE 419	Petroleum modelling	Basic	●	●	●	●						●	●
	PRE 414	Advanced reservoir engineering	Basic	●	●		●						●	
	PRE 415	Core analysis	Basic	●										
	---	Graduation project	Basic	●	●	●			●				●	●
	PRE 417	Enhanced oil recovery II	Basic	●			●							
	PRE 418	Reservoir simulation	Basic	●	●	●							●	●
	PRE 413	Petroleum Economics	Basic				●				●			
	PRE 420	Well testing	Basic	●			●							
	PRE 421	Reservoir management	Basic	●	●		●						●	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation**